

**WHAT IS CLAIMED IS:**

1. A microstrip filter comprising:  
a plurality of resonators having gaps between each said resonators such that there  
is at least one longitudinal gap and at least one transverse gap,  
a dielectric block having said plurality of resonators on a first side; and  
an enclosure at least partially covering said plurality of resonators.
2. The microstrip filter of claim 1, wherein said enclosure has a length dimension  
and is open at opposite ends of its length.
3. The microstrip filter of claim 1, wherein said plurality of resonators have an input  
portion and an output portion.
4. The microstrip filter of claim 3, wherein said enclosure is open near at least one of  
said input portion and said output portion..
5. The microstrip filter of claim 4, wherein said enclosure substantially encloses said  
resonator portion within a predetermined area.
6. The microstrip filter of claim 1, adapted to operate in a frequency range of  
between about 1 and 100 GHz.

1           7.     The microstrip filter of claim 6, wherein the thickness of said dielectric block is at  
2     least one-twentieth of the microstrip filter's pass-band frequency's wavelength in the dielectric  
3     block.

1           8.     A high frequency filter comprising:

2                 a dielectric substrate having a top side and a bottom side;

3                 an input portion on said top side of said dielectric substrate

4                 a first resonator portion spaced from said input portion and on said top side;

5                 a second resonator portion spaced from said first resonator and on said top side;

6                 and

                  a third resonator portion spaced from said second resonator and on said top side,

7                 wherein at least one of said input portion, said first resonator, said second resonator and said

8                 third resonator is spaced such that it is transversely coupled from another resonator portion, and

9                 wherein at least one of said input portion, said first resonator, said second resonator and said

10                third resonator is longitudinally spaced from another resonator.

1           9.     The high frequency filter of claim 8, further comprising:

2                 a fourth resonator on said top side,

3                 a fifth resonator spaced from said fourth resonator and on said top side,

4                 a sixth resonator spaced from said fifth resonator and on said top side, and

5                 an output portion spaced from said sixth resonator and on said top side, wherein

6                 said fourth resonator, said fifth resonator, said sixth resonator and said output portion are

7                 symmetric, about a line, with said third resonator, said second resonator, said first resonator, and

8                 said input portion respectively.

1           10.    The high frequency filter of claim 8, further comprising a ground plan on said  
2 bottom side of said dielectric substrate.

1           11.    The high frequency filter of claim 8, further comprising an enclosure substantially  
2 covering said dielectric substrate.

1           12.    The high frequency filter of claim 11, wherein said enclosure is open adjacent to  
2 at least one of said input portion and said output portion.

1           13.    The high frequency filter of claim 12, wherein said enclosure comprises a  
2 conductive material on the surface of said enclosure.

1           14.    The high frequency filter of claim 8, further comprising a carrier plate, said  
2 dielectric substrate being attached to said carrier plate.

1           15.    The high frequency filter of claim 8 wherein the thickness of said dielectric  
2 substrate from said top side to said bottom side is at least one twentieth of the high frequency  
3 filter's pass-band frequency's wavelength in said dielectric substrate.

1           16.    The high frequency filter of claim 8, wherein said filter is at least one of a band-  
2 pass, low pass and a high pass filter.

1           17.     The high frequency filter of claim 8, wherein said filter is at least one of a strip  
2 line filter and a microstrip filter.

1           18.     The high frequency filter of claim 8, wherein at least one of said first, second and  
2 third resonators have a variation in their width over their length.

1           19.     The high frequency filter of claim 8, wherein said high frequency filter is adapted  
2 to operate at frequencies substantially between 1 GHz and 100 GHz.

1        20.    An electronic system that is adapted to process high frequency signals  
2    comprising:  
3        a high frequency filter, said filter comprising:  
4        a dielectric substrate having a top surface and a bottom surface;  
5        a plurality of resonators spaced from each other on said top surface;  
6        an input portion spaced from a first one of said plurality of resonators;  
7        an output portion spaced from a second one of said plurality of resonators;  
8    wherein at least one of said plurality of resonators is coupled to another resonator or said input  
9    portion via a transverse coupling, and wherein at least another one of said plurality of resonators  
10   is coupled longitudinally from another one of said plurality of resonators, and  
11        an enclosure substantially covering said plurality of resonators.

1        21    The electronic system of claim 20 wherein said enclosure is open-ended  
2    substantially near at least one of said input portion and said output portion.